

Title (en)

SELF-ALIGNED CONTACTS FOR NANOSHEET FIELD EFFECT TRANSISTOR DEVICES

Title (de)

SELBSTAUSGERICHTETE KONTAKTE FÜR NANOFOLIENFELDEFFEKTTTRANSISTORVORRICHTUNGEN

Title (fr)

CONTACTS AUTO-ALIGNÉS POUR DISPOSITIFS À TRANSISTOR À EFFET DE CHAMP À NANOFEUILLES

Publication

EP 3836196 A1 20210616 (EN)

Application

EP 19215873 A 20191213

Priority

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Abstract (en)

A method for forming a semiconductor device, comprising forming a first transistor structure and a second transistor structure separated by a trench. The first and the second transistor structures comprise a plurality of stacked nanosheets forming a channel structure, and a source portion and a drain portion horizontally separated by the channel structure. A first and a second spacer is formed in the trench at sidewalls of the second transistor structures, both protruding above a top surface of the transistor structures. The method comprises applying a first mask layer including an opening exposing the first spacer at a first source/drain portion of the first transistor structure and covering the second spacer, partially etching the exposed first spacer through the opening, exposing at least parts of a sidewall of the first source/drain portion of the first transistor structure, and removing the mask layer. The method further comprises depositing a contact material over the transistor structures and the first and second spacer, filling the trench and contacting the first source/drain portion of the first transistor structure, and etching back the contact material layer below a top surface of the second spacer.

IPC 8 full level

H01L 21/336 (2006.01); **H01L 21/74** (2006.01); **H01L 21/768** (2006.01); **H01L 21/8238** (2006.01); **H01L 23/528** (2006.01); **H01L 27/02** (2006.01); **H01L 27/092** (2006.01); **H01L 29/06** (2006.01); **H01L 29/417** (2006.01); **H01L 29/775** (2006.01)

CPC (source: EP US)

H01L 21/02603 (2013.01 - US); **H01L 21/743** (2013.01 - EP); **H01L 21/76224** (2013.01 - US); **H01L 21/76895** (2013.01 - EP); **H01L 21/76897** (2013.01 - EP); **H01L 21/823807** (2013.01 - EP US); **H01L 21/823814** (2013.01 - US); **H01L 21/823864** (2013.01 - US); **H01L 21/823871** (2013.01 - EP US); **H01L 21/823878** (2013.01 - EP US); **H01L 23/5286** (2013.01 - EP US); **H01L 27/092** (2013.01 - EP US); **H01L 29/0653** (2013.01 - EP); **H01L 29/0673** (2013.01 - EP US); **H01L 29/41733** (2013.01 - EP US); **H01L 29/42392** (2013.01 - US); **H01L 29/66439** (2013.01 - EP); **H01L 29/66515** (2013.01 - US); **H01L 29/66545** (2013.01 - US); **H01L 29/66553** (2013.01 - US); **H01L 29/66742** (2013.01 - US); **H01L 29/66772** (2013.01 - EP); **H01L 29/775** (2013.01 - EP); **H01L 29/78618** (2013.01 - EP US); **H01L 29/78654** (2013.01 - EP); **H01L 29/78696** (2013.01 - US); **H01L 29/42392** (2013.01 - EP); **H01L 29/78696** (2013.01 - EP)

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Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

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DOCDB simple family (application)

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